REMARKS

Claims 1-4 were examined and reported in the Office Action. Claims 1-4 are rejected. Claim 2 is cancelled. Claims 1 and 3-4 are amended. Claims 1 and 3-4 remain.

Applicants request reconsideration of the application in view of the following remarks.

I. 37 CFR § 1.75(d)(1)

The specification is objected to under 37 CFR § 1.75(d)(1) as failing to provide proper antecedent basis for the claimed subject matter. Applicant has amended claim 3 to overcome the 37 CFR § 1.75(d)(1).

Accordingly, withdrawal of the 37 CFR § 1.75(d)(1) objection for the specification is respectfully requested.

II. 35 U.S.C. §112, second paragraph

It is asserted in the Office Action that claim 1 is rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant has amended claim 1 to overcome the 35 U.S.C. §112, second paragraph rejection.

Accordingly, withdrawal of the 35 U.S.C. §112, second rejection for claim 1 is respectfully requested.

III. 35 U.S.C. §102(b)

It is asserted in the Office Action that claim 1 is rejected under 35 U.S.C. §102(b) as being anticipated by Applicant's admitted prior art ("AAPA"). Applicant respectfully disagrees.

According to MPEP §2131, "'[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.' (Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628,

631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). 'The identical invention must be shown in as complete detail as is contained in the ... claim.' (Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e., identity of terminology is not required. (In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990))."

Applicant's amended claim 1 contains the limitations of "[a] method of fabricating a capacitor for a semiconductor device, comprising the steps of: a) forming a sacrificial layer in the height of the capacitor on a substrate, wherein an etch rate of an upper portion of the sacrificial layer is lower than that of a lower portion of the sacrificial layer, wherein the sacrificial layer is a TEOS layer; b) forming a trench by selectively eliminating the sacrificial layer by a wet etch process; c) forming a bottom electrode in the trench; d) eliminating the sacrificial layer; e) forming a dielectric thin film on the bottom electrode; and f) forming the top electrode on the dielectric thin film."

Applicant's claimed invention only uses a TEOS layer as the sacrificial layer. Thus, Applicant's claimed invention can simplify operation steps for fabricating a capacitor. Therefore, production costs can be reduced.

Distinguishable, AAPA uses two different layers as the sacrificial layer. In particular, AAPA uses a phosphor-silicate glass (PSG) layer and a TEOS layer as sacrificial layers. Therefore, AAPA does not teach, disclose or suggest "forming a sacrificial layer in the height of the capacitor on a substrate, wherein an etch rate of an upper portion of the sacrificial layer is lower than that of a lower portion of the sacrificial layer, wherein the sacrificial layer is a TEOS layer."

Thus, AAPA does not disclose, teach or suggest the limitations contained in Applicant's amended claim 1, as listed above. Since AAPA does not disclose, teach or suggest all of Applicant's amended claim 1 limitations, as listed above, Applicant respectfully asserts that a prima facie rejection under 35 U.S.C. §102(b) has not been

adequately set forth relative to AAPA. Thus, Applicant's amended claim 1 is not anticipated by AAPA.

Accordingly, withdrawal of the 35 U.S.C. §102 (b) rejection for claim 1 is respectfully requested.

IV. 35 U.S.C. §103(a)

A. It is asserted in the Office Action that claims 1-2 are rejected under 35 U.S.C. §103(a) as being unpatentable over U. S. Patent No. 6,215.187 issued to Ooto et al. ("Ooto") in view of U. S. Patent No. 6,355,521 issued to Cho ("Cho"). Applicant respectfully disagrees.

According to MPEP §2142 "[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." (In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). Further, according to MPEP §2143.03, "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." *"All words in a claim must be considered* in judging the patentability of that claim against the prior art." (In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970), emphasis added.)

Applicant's amended claim 1 contains the limitations of "[a] method of fabricating a capacitor for a semiconductor device, comprising the steps of: a) forming a sacrificial layer in the height of the capacitor on a substrate, wherein an etch rate of an upper portion of the sacrificial layer is lower than that of a lower portion of the sacrificial layer, wherein the sacrificial layer is a TEOS layer; b) forming a trench by

selectively eliminating the sacrificial layer by a wet etch process; c) forming a bottom electrode in the trench; d) eliminating the sacrificial layer; e) forming a dielectric thin film on the bottom electrode; and f) forming the top electrode on the dielectric thin film."

Applicant's claimed invention only uses a TEOS layer as the sacrificial layer. Thus, Applicant's claimed invention can simplify operation steps for fabricating a capacitor. Therefore, production costs can be reduced.

Ooto discloses that there are two interlayer oxide films 5d and 5e. (Ooto, column 10, lines 44 – 65). According to Ooto, an isotropic wet etch rate of the lower interlayer oxide film 5d is higher than that of the higher interlayer oxide film 5e. The lower interlayer oxide film 5d, however, is a boron-phosphorus-tetraethylorthosilicate (BPTEOS) film; and the upper interlayer oxide film 5e is a tetraethylorthosilicate (TEOS) film. That is, two different layers are used. Therefore, Ooto does not teach, disclose or suggest "forming a sacrificial layer in the height of the capacitor on a substrate, wherein an etch rate of an upper portion of the sacrificial layer is lower than that of a lower portion of the sacrificial layer, wherein the sacrificial layer is a TEOS layer."

Similarly to Ooto, Cho uses two different layers. In particular, a BPTEOS layer and a TEOS layer are used as sacrificial layers. Therefore, Cho does not teach, disclose or suggest "forming a sacrificial layer in the height of the capacitor on a substrate, wherein an etch rate of an upper portion of the sacrificial layer is lower than that of a lower portion of the sacrificial layer, wherein the sacrificial layer is a TEOS layer."

Therefore, even if the teachings of Ooto were combined with that of Cho, the resulting invention would still not contain all of the limitations of Applicant's amended claim 1. Since neither Ooto, Cho, nor the combination of the two disclose, teach or suggest all the limitations contained in Applicant's claim 1, as listed above, there would not be any motivation to arrive at Applicant's claimed invention. Thus, Applicant's claim 1 is not obvious over Ooto in view of Cho since a *prima facie* case of obviousness has not been met under MPEP §2142.

Accordingly, withdrawal of the 35 U.S.C. §103(a) rejection for claims 1 (claim 2 is cancelled) is respectfully requested.

B. It is asserted in the Office Action that claims 3-4 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ooto and Cho, in view U. S. Patent No. 5,546,312 issued to Mozumder et al. ("Mozumder"). Applicant respectfully disagrees.

Applicant's amended claim 3 directly depends on amended claim 1. As asserted above in section IV(B), neither Ooto nor Cho teach, disclose or suggest "forming a sacrificial layer in the height of the capacitor on a substrate, wherein an etch rate of an upper portion of the sacrificial layer is lower than that of a lower portion of the sacrificial layer, wherein the sacrificial layer is a TEOS layer."

It is asserted in the Office Action that Mazumder is relied upon for teaching a sacrificial layer is formed in response to a RF power, an O_2 flow, and a spacing between the substrate and the shower head. Mazumder, however, does not teach, disclose or suggest "the sacrificial layer is formed in response to a RF power, an 0_2 flow, and a spacing between the substrate and the shower head, and the lower portion of the sacrificial layer has a higher wet etching rate than the upper portion of the sacrificial layer does." Moreover, Mazumder does not teach, disclose or suggest "forming a sacrificial layer in the height of the capacitor on a substrate, wherein an etch rate of an upper portion of the sacrificial layer is lower than that of a lower portion of the sacrificial layer, wherein the sacrificial layer is a TEOS layer."

Therefore, even if the teachings of Ooto and Cho were combined with that of Mazumder, the resulting invention would still not contain all of the limitations of Applicant's amended claim 1. Since neither Ooto, Cho, Mazumder, nor the combination of the three disclose, teach or suggest all the limitations contained in Applicant's claim 1, as listed above, there would not be any motivation to arrive at Applicant's claimed invention. Thus, Applicant's claim 1 is not obvious over Ooto in view of Cho and further in view of Mazumder since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims the directly or indirectly depend on

amended claim 1, namely claims 3-4, also would also not be obvious over Ooto in view of Cho and further in view of Mazumder for the same reason.

Accordingly, withdrawal of the 35 U.S.C. §103(a) rejections for claims 3-4 are respectfully requested.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending, namely 1, and 3-4, patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

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Dated: May 19, 2004

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail with sufficient postage in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, Virginia 22313-1450 on May 19, 2004.

_____
Jean Svoboda

ABSTRACT

A method of fabricating a capacitor for improving the shape of a bottom electrode by using a sacrificial layer at a producing process. The method includes forming a sacrificial layer in the height of the capacitor on a substrate, an etch rate of an upper portion of the sacrificial layer is lower than that of a lower portion of the sacrificial layer, and the sacrificial layer is a TEOS layer; forming a trench by selectively eliminating the sacrificial layer by a wet etch process; forming a bottom electrode in the trench; eliminating the sacrificial layer; forming a dielectric thin film on the bottom electrode; and forming the top electrode on the dielectric thin film.